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being least in those with an abundance of coarse submerged water plants, and greatest in those virtually free from such vegetation. The reasons for this difference seem not well established in this paper, but they are possibly connected with differences of light and heat already referred to. The most productive body of water examined was a large permanent pond, with neither inlet nor outlet at a low stage of water, and with bottom and shores of bare mud.

The conditions which favor a large annual production of this minute aquatic life also seem to favor a large catch of fish, but no direct connection of cause and effect is here made out. The plankton is, however, an indispensable element in the food of fishes, the young of nearly every species in our waters being absolutely dependent upon it at some period of their lives, and adult fishes of several species making large use of it during the season of its greatest abundance.

No study of the minute life of a river system has heretofore been made of equal extent, thoroughness, and scientific character with that reported in this paper, and a knowledge of the facts contained in it is indispensable to an understanding of some of the problems of a scientific fish-culture in fresh-water situations.

The work here reported is a part of that of the biological survey of Illinois. It was planned, established, and equipped by Dr. S. A. Forbes, director of the State Laboratory, and was done under the immediate superintendence of Professor Frank Smith, of the University of Illinois, during the first fifteen months, beginning with April, 1894, and of Dr. C. A. Kofoed, superintendent of the station, the writer of this report, during the remainder of the five-year period.

THE MISSOURI BOTANICAL GARDEN REPORT.

ADVANCE galleries of the administration report of this well-known institution, for which we are indebted to its director, show the customary progress. In 1904 the number of species and varieties of plants cultivated was increased from 11,357 to 14,207, an addition of

25 per cent. The herbarium was enlarged from 465,205 to 489,310 specimens, an increase of a little over 5 per cent., and the total of books and pamphlets in the library was raised from 42,262 to 45,892, or something over 8 per cent.

The world's fair recently held in St. Louis raised the visitors to the garden to over three times the customary number, a total of 316,747, or about 2 per cent. of the entire paid admissions to the exposition. That these visitors were of an unusually intelligent and interested class is noted from observation and inferred from their purchase of a little handbook of the garden, the sales of which amounted to 1.51 per cent. of the number of visitors in contrast with an earlier average of .246 of 1 per cent.

The report also contains information as to the school of botany, the gardening course, the research work at the garden and the testamentary flower sermon, banquets, and flower show, all of which latter were influenced by the holding of the St. Louis exposition, at which the garden met with recognition in the form of two grand prizes and several minor awards.

The financial report of the trustees shows that street improvements, sewers, property expenses and the like have wiped out their savings of the past fifteen years, on which needed buildings and enlargements have been planned by the director, and it is evident that unless unexpected aid is rendered the garden by some public-spirited citizen these improvements must necessarily be deferred for at least ten years, although the maintenance of the establishment on its present scale is not in doubt, and there is assurance in its unencumbered endowment of some \$3,000,000 that gradually it will enlarge to an importance and usefulness equaling the most sanguine expectations of its friends.

THE NATIONAL GEOGRAPHIC SOCIETY.

PROFESSOR WILLIS L. MOORE, chief of the U. S. Weather Bureau, was elected president of the National Geographic Society, at the last meeting of the board of managers, at Washington. Professor Moore has been ac-

tively identified with the society for many years and has served on the board of managers since 1897. At the same meeting Mr. Henry Gannett, chief geographer of the U. S. Geological Survey was elected vice-president of the society. Mr. Gannett was one of the incorporators of the society in 1888, and has served continuously on the board since that date. At the same meeting Hon. O. P. Austin, chief of the Bureau of Statistics, was elected secretary, Mr. John Joy Edson, president of the Washington Loan and Trust Co., was elected treasurer; Gilbert H. Grosvenor, editor; and Miss Eliza R. Scidmore, foreign secretary.

The society is now entering upon its eighteenth year. It has a total membership of 3,400, of whom 1,125 are residents of Washington, and 2,275 distributed throughout every state in the union and in nearly every country in the world. Its object is the increase and diffusion of geographic knowledge which it accomplishes:

1. Encouraging worthy plans for exploration. The society has sent one expedition to Alaska, another to Mont Pelée, Martinique, and La Soufrière, St. Vincent, and has been associated with several Arctic and other expeditions. At present its representative has direction of the scientific work of the Ziegler Polar Expedition, and is second in command.

2. By publishing an illustrated monthly magazine, the *National Geographic Magazine* and many large maps.

3. By an annual series of thirty addresses delivered in Washington by prominent men. The speakers this year have included Hon. John W. Foster, Wm. E. Curtis, Baron Kentaro Kaneko, Charles Emory Smith, F. H. Newell, Gifford Pinchot, G. K. Gilbert, etc.

4. By the maintenance of a library.

The society has now been established in its handsome new home, Hubbard Memorial Hall, for nearly a year. It was erected as a memorial to the first president of the society by the family of Mr. Hubbard.

SCIENTIFIC NOTES AND NEWS.

AFTER twenty years of service as United States commissioner of labor, Dr. Carroll D.

Wright retired from that office on January 31, and went to Worcester, Mass., to assume the presidency of Clark College. His successor, Dr. Charles P. Neill, took charge of the Bureau of Labor on February 1.

FISH COMMISSIONER GEORGE M. BOWERS has been notified of President Roosevelt's desire that he remain at the head of the Bureau of Fisheries during the next administration. The president has several times expressed his approval of the manner in which the affairs of the bureau were being conducted, and it is reported that he recently reiterated his satisfaction, remarking that all he asked for the next four years was a continuance of the energetic and zealous work which has characterized Commissioner Bowers's seven years of service.

PROFESSOR A. AUWERS, the eminent astronomer of Berlin, has been elected an honorary member of the St. Petersburg Academy of Sciences.

THE cross of officer of the Legion of Honor has been conferred by the French government on Dr. Otto Nordenskjöld for his South Polar explorations.

THE Société Nationale d'Agriculture de France has awarded to Professor Wm. B. Alwood, of Charlottesville, Va., a diploma and silver medal for his recent work in pomology, especially as relates to the fermentation of by-products from apples. A gold medal was also awarded the exhibit on Oenological Technology prepared by Professor Alwood for the St. Louis Exposition.

MR. N. H. DARTON, of the U. S. Geological Survey, has been awarded a gold medal for his geological model of the Black Hills, exhibited by the South Dakota Commission at their section in the Mines and Mining building, at the St. Louis Exposition.

DR. G. B. HALSTED'S 'Rational Geometry,' reviewed in SCIENCE last week, is being translated into French by Professor C. Barbarin, president of the Société des sciences physiques et naturelles de Bordeaux. His address on the 'Message of the Non-Euclidean Geometry,' given as vice-president of the American